

REMARKS

By the present amendment, claim 1 to 7 and 11 to 16 are pending in the application. Claim 1 is the only independent claim.

Restriction Requirement

Non-elected, withdrawn method claims 8 to 10 and 17 to 20 have been canceled by the present amendment without prejudice to the filing of a divisional patent application directed to the subject matter of canceled method claims 8 to 10 and 17 to 20.

Support For Claim Amendments

In claim 1, the upper limit of 4.5% Cr is supported by Example No. 21 of Table 3 at page 27 of the specification where the steel contains 4.5% Cr. None of the other examples of Table 1 (page 24), Table 3 (page 27), Table 5 (page 31) or Table 7 (page 35) disclose Cr in the steel.

The temperature range of 300°C to 650°C for 5 seconds or more is disclosed in the specification, e.g., at page 14, lines 17 to 22.

§103

Claims 1 to 7 and 11 to 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Japan No. 2000-239808.

Claims 1 to 7 and 11 to 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Japan No. 09-170053.

These rejections, as applied to the amended claims, are respectfully traversed.

Patentability

Japan No. 2000 -239808 (the “ ‘808 patent”)

The technology disclosed in the ‘808 patent relates to a corrosion resistant soft magnetic material excellent in antibacterial characteristic used in solenoid valves, where the

soft magnetic material containing the specific composition is treated hot rolling, cold rolling or drawing subjected to holding a temperature range of 700°C to 1050°C for 10 minutes or more. Thus, the material of the ‘808 patent has a second phase composed essentially of Cu in the vicinity of the surface of the material precipitated in an amount of 0.15 vol % or more in the matrix.

On the other hand, the present invention targets to precipitate a fine Cu phase by means of holding the steel sheet at 300°C to 650°C, which is a much lower holding temperature than the ‘808 patent, during the steel sheet production process or after punching (as described in pages 17 to 19 of the specification).

It is well known that a high strength steel sheet is obtained by precipitation of fine metallic Cu phase other than in electrical steel sheet production. In case of the electrical steel sheet production, a more severe production process is required because the precipitates are harmful to crystal grain growth and the improvement of magnetic properties. Therefore, the present invention discovered that the fine Cu precipitates do not adversely affect the magnetic properties, because the electrical steel sheet contains a metal phase comprised of Cu having a diameter of 0.1 μm or less by means of holding in a heat treatment at a temperature range of 300°C to 650°C for 5 seconds or more during a production of a processed part.

If the electrical steel sheet is treated outside conditions defined in the claims, Cu contained in the steel sheet forms solid soluted Cu or a course metallic Cu phase which deteriorates magnetic properties. Therefore, if the steel sheet is treated under the conditions, such as high temperature of 700°C to 1050°C for a long time as mentioned in the ‘808 patent, Cu precipitates grow coarsely.

Therefore, the product obtained by the present invention is quite different from the product obtained by the ‘808 patent because of a different production process.

Japan No. 09-170053 (the “‘053 patent)

The technology disclosed in the ‘053 patent relates to a ferritic stainless steel sheet containing Cr: 10 - 30% excellent in antibacterial characteristics, where the stainless steel sheet contains Cu-enriched precipitates of more than 0.2 vol % by means of aging treatment at 500 - 800°C. On the other hand, the present invention provides an electrical steel sheet and contains low amount of Cr of less than 4.5%, and low heat treatment temperature of 300 - 650° which is a very different Cr content and a different heat treating temperature as compared to the ‘053 patent.

One skilled in the art could not conceive an electrical steel sheet containing a low amount of Cr to improve magnetic properties from the teachings of the ‘053 patent describing ferritic stainless steel sheet containing a high Cr content.

Therefore, the present invention is very different from the ‘053 patent.

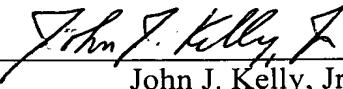
It is therefore submitted that amended independent claim 1, and all claims dependent thereon, are patentable over the ‘808 patent or ‘053 patent.

CONCLUSION

It is submitted that in view of the present amendment and foregoing remarks, the application is now in condition for allowance. It is therefore respectfully requested that the application, as amended, be allowed and passed for issue.

Respectfully submitted,

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